

REVOLUTIONIZING MOBILITY

HYBRID VEHICLE WITH SMOOTH
MECHANICAL ELECTRIC PROPULSION
TRANSITION



Team – Mechanites
AAVARTAN- 2023-24
MECH-05

01 PART ONE INTRODUCTION

02 PART TWO PROBLEM & SOLUTION

03 PART THREE WHAT IS HYBRID
VEHICLE & TYPES

04 PART THREE PARTS &
MANUFACTURING

05 PART FOUR OTHER
BENIFITS

OVERVIEW

A BRIEF OVERVIEW OF TODAY PRESENTATION

PROBLEM & SOLUTION

HEV IS

FUTURE

AS WE KNOW THAT AUTOMOBILE INDUSTRY IS SWITCHING TO EV AND THERE ARE VARIETY OF CHANGES WHICH WILL BE REQUIRED IN NEW JOURNEY OF AUTOMOBILE INDUSTRY

PROBLEM & SOLUTION

AN E-VEHICLE RUNS ON BATTERY , THERE MIGHT BE A SERIOUS SITUATION WHEN BATTERY IS COMPLETELY DRAINED SO AT THAT TIME IF THERE IS AN ANOTHER POWER GENERATION SYSTEM (MECHANICAL) AVAILABLE IN CAR WHICH CAN RUN THE CAR UNTIL NEXT CHARGING STATION ARRIVED



3 /

WHAT IS A HYBRID VEHICLE ?

A hybrid vehicle is a car that combines two or more different power sources for propulsion, typically an internal combustion engine (usually gasoline) and an electric motor.

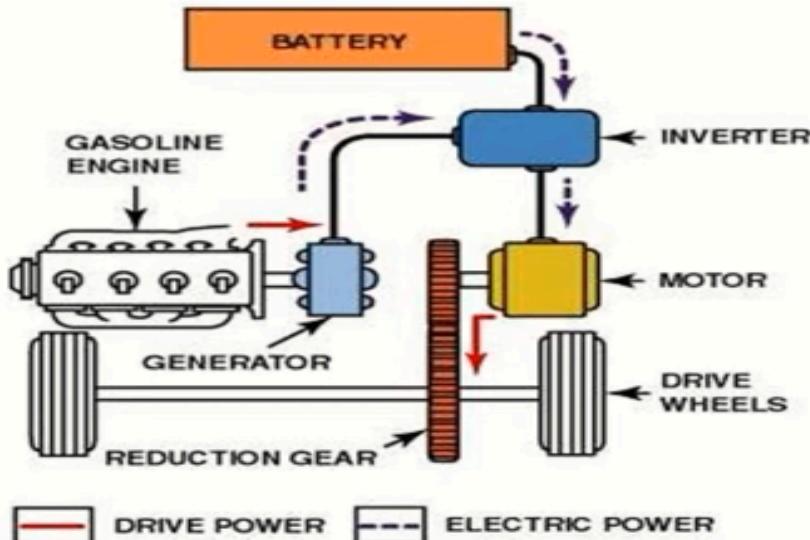
SERIES HYBRID

Fig: Series
Hybrid

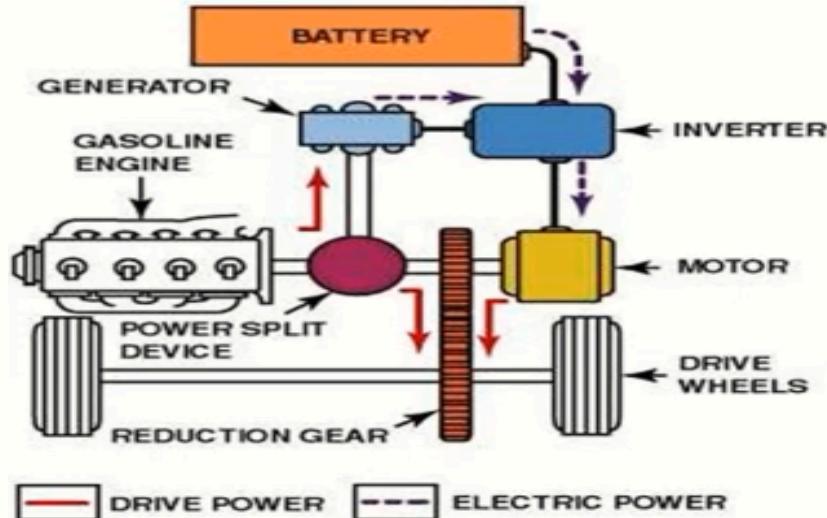
PARALLEL HYBRID

Fig: Parallel
Hybrid

SERIES-PARALLEL HYBRID

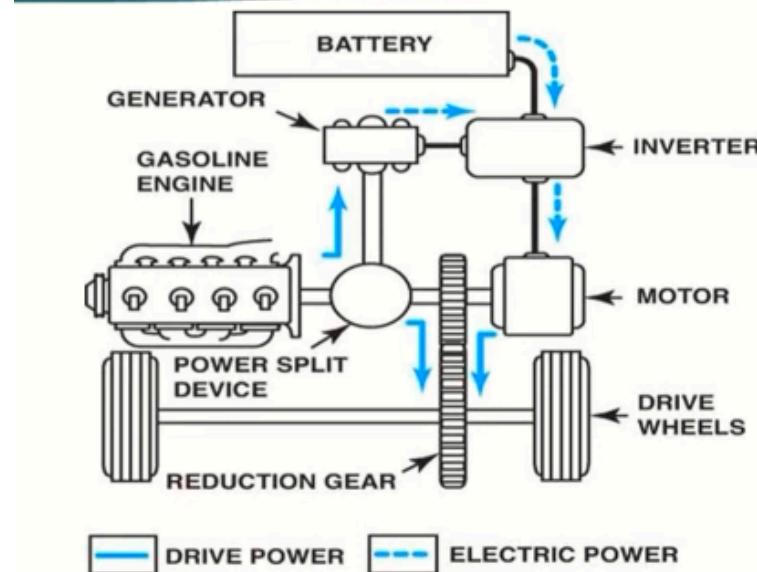


Fig: Series Parallel
Hybrid

A close-up photograph of the front wheel and side profile of a light-colored Lamborghini sports car. The car's sleek lines, carbon fiber accents, and multi-spoke alloy wheel are visible. The background is dark, making the car stand out.

4

PARTS & MANUFACTURING



1. Engine

- ▶ It's much same as other vehicles engine, but the size of hybrid electric vehicle engine is small and it's more fuel efficient.
- ▶ There are two types of engine, mostly used in HEV vehicle
 - a. Petrol Engine
 - b. Diesel Engine



2. Battery

- ▶ It stores the energy generated from gasoline engine or during regenerative braking, from the electric motor.
- ▶ There are 3 types of batteries used in HEV vehicles
 - a. Lead Acid(2.2 volt)
 - b. Nickel Cadmium (1.2 volt)
 - c. Lithium-ion(3.7 volt)

Fig: Battery

3. Electrical Motor

- ▶ It's power the vehicle at low speed and assist the gasoline engine when additional power is needed.
- ▶ Most of the electric machines used in hybrid vehicles are brushless DC motors (BLDC).



4. Controller

- ▶ The controller is used to charge the battery or to supply the power to electric motor.
 - a. Converts Battery DC to a chopped DC power
 - b. Can chop in amplitude (DC) or frequency (AC)
 - c. Power is based on low voltage input signal 4-20 mA or 0-5V



Fig: Controller

5. Generator

- ▶ It converts mechanical energy from engine into electrical energy, which can be used by electric motor stored in the battery. It's also used to start the gasoline engine instantly.



Fig: Generator

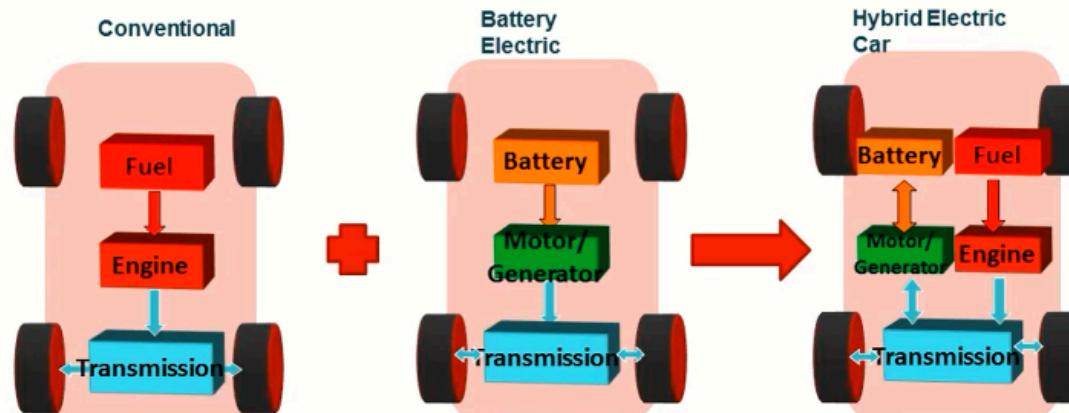
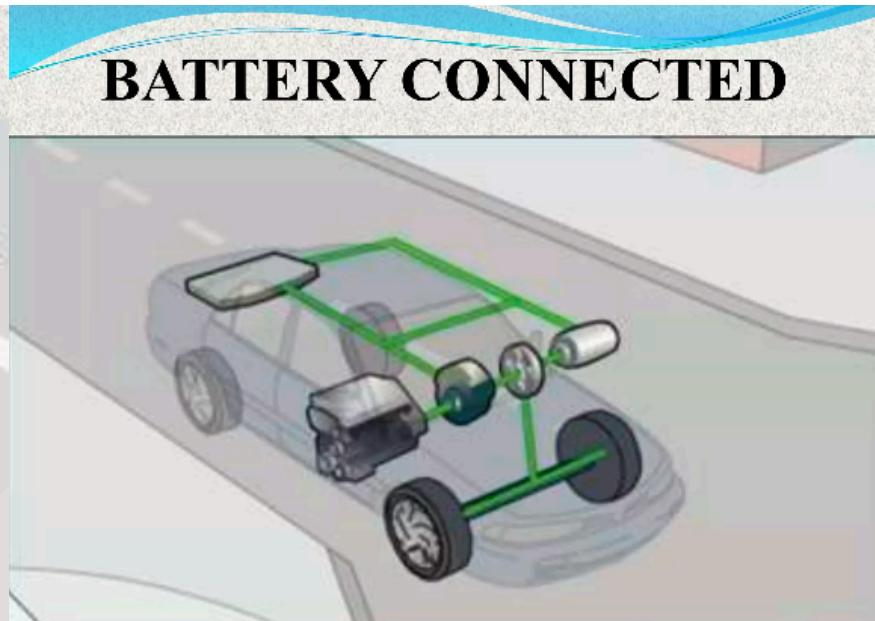
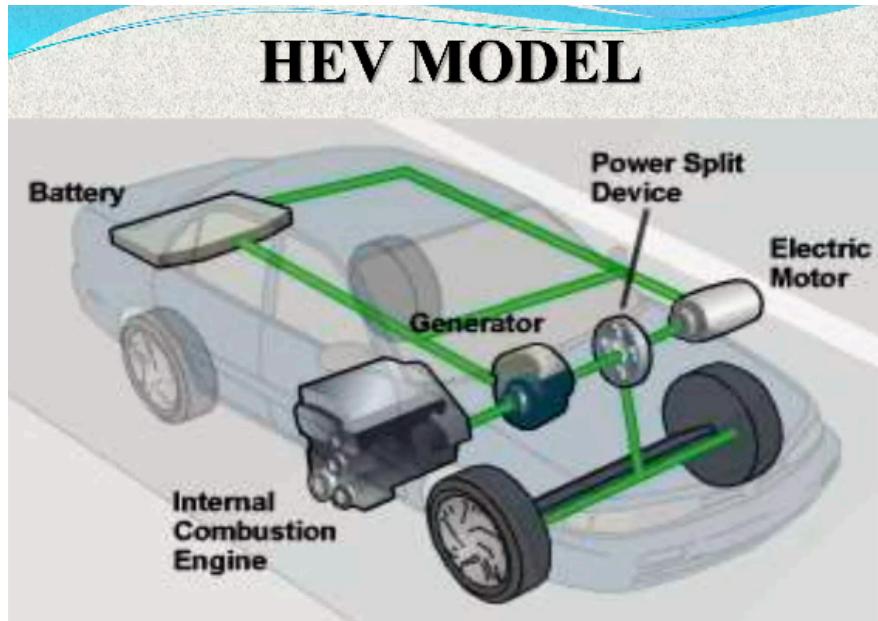
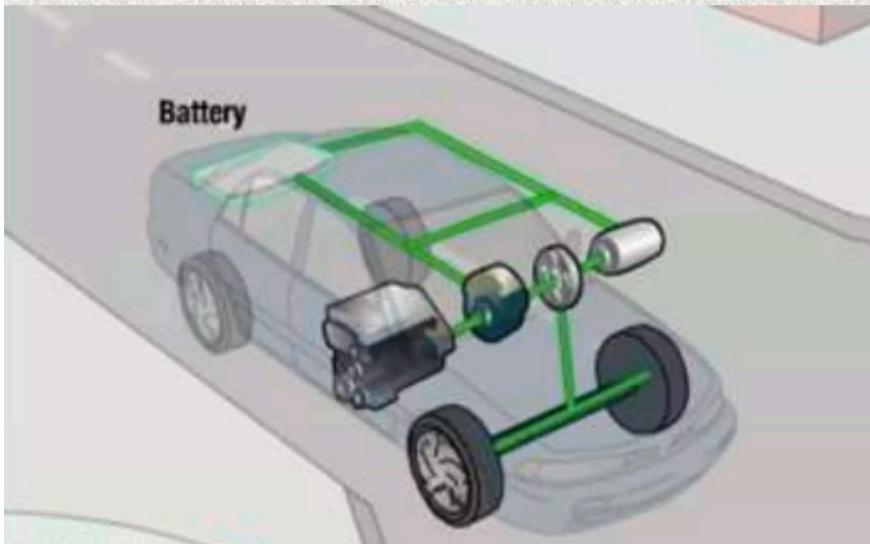


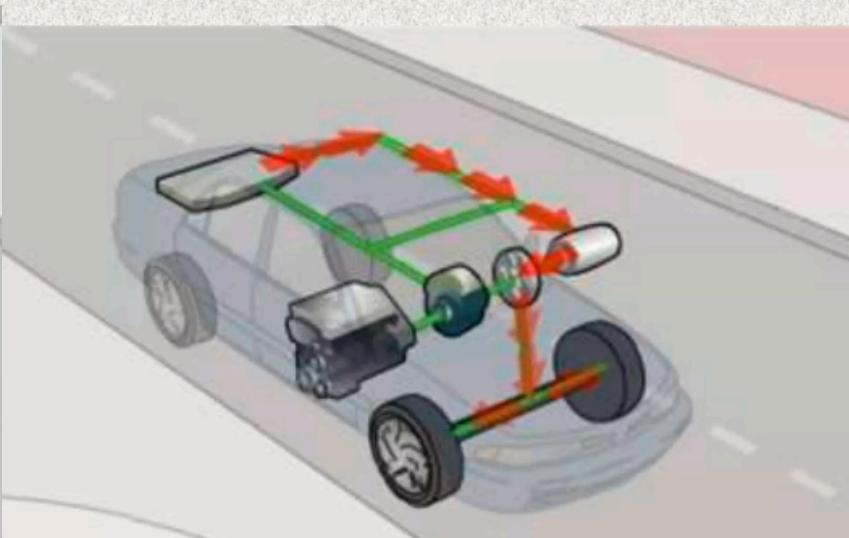
Fig: Hybrid Vehicle Mean

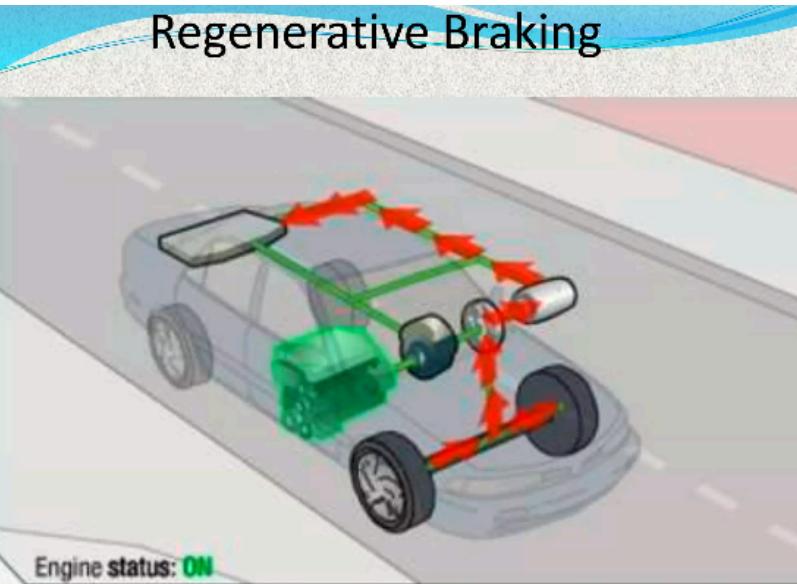
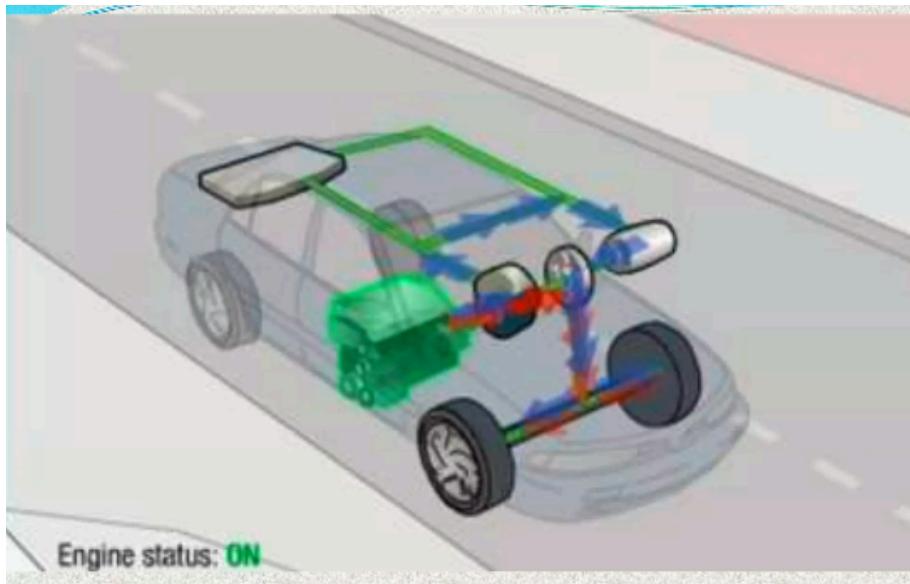


CAR STARTS



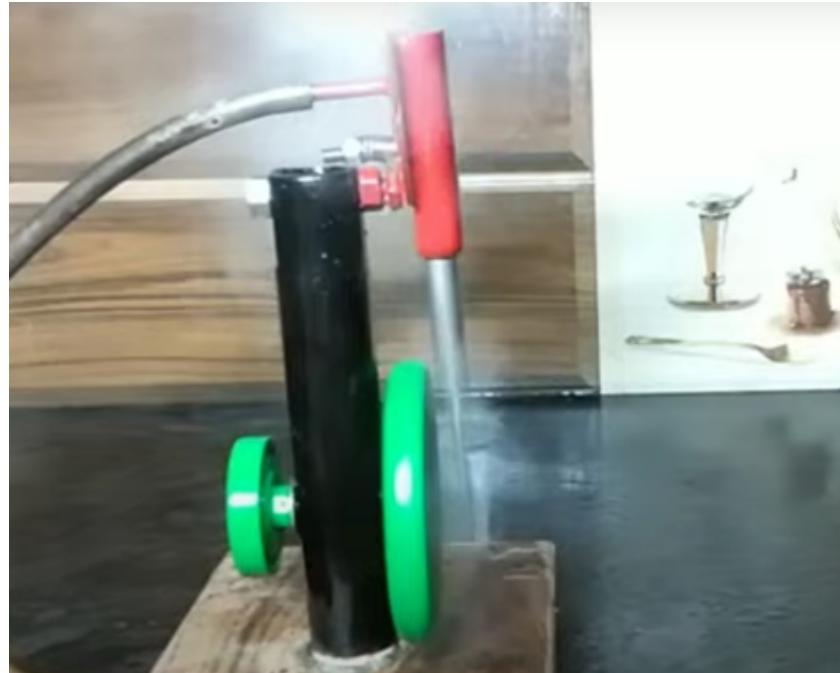
BATTERY SUPPLY





4

USING STEAM ENGINE IN PROTOTYPE



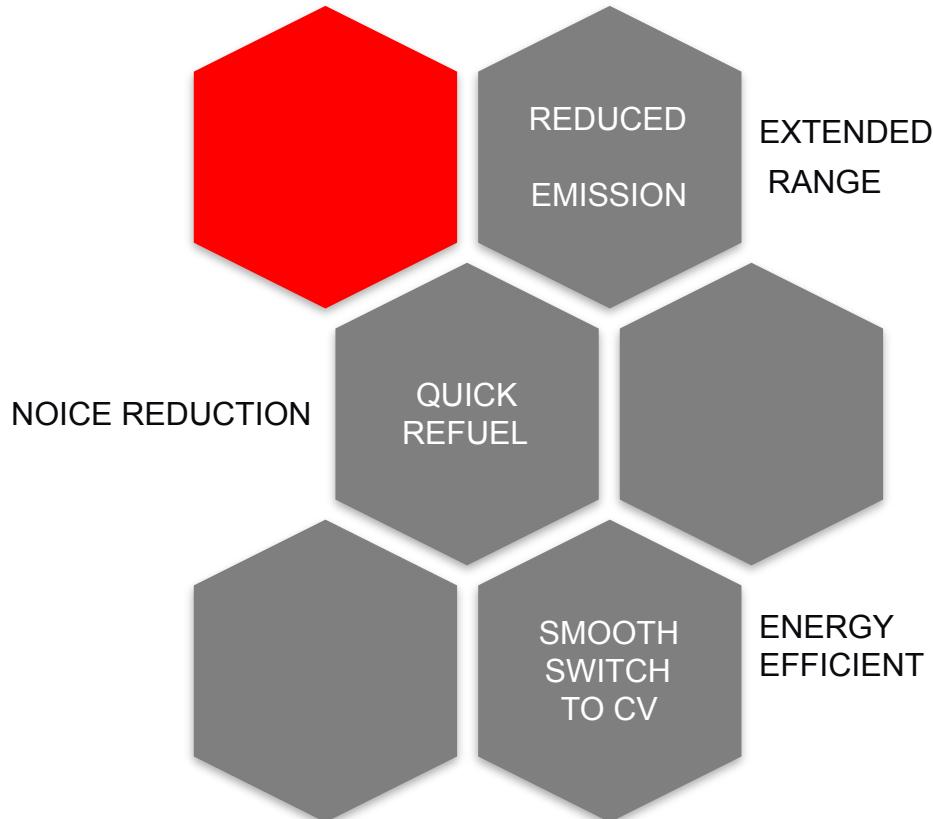
A close-up photograph of the front wheel and side profile of a light-colored Lamborghini sports car. The wheel is black with a multi-spoke design and yellow brake calipers featuring the Lamborghini logo. The car's body has sharp, angular lines. A red rectangular overlay is positioned behind the wheel, containing a large white number '5' and a thin vertical white line.

5

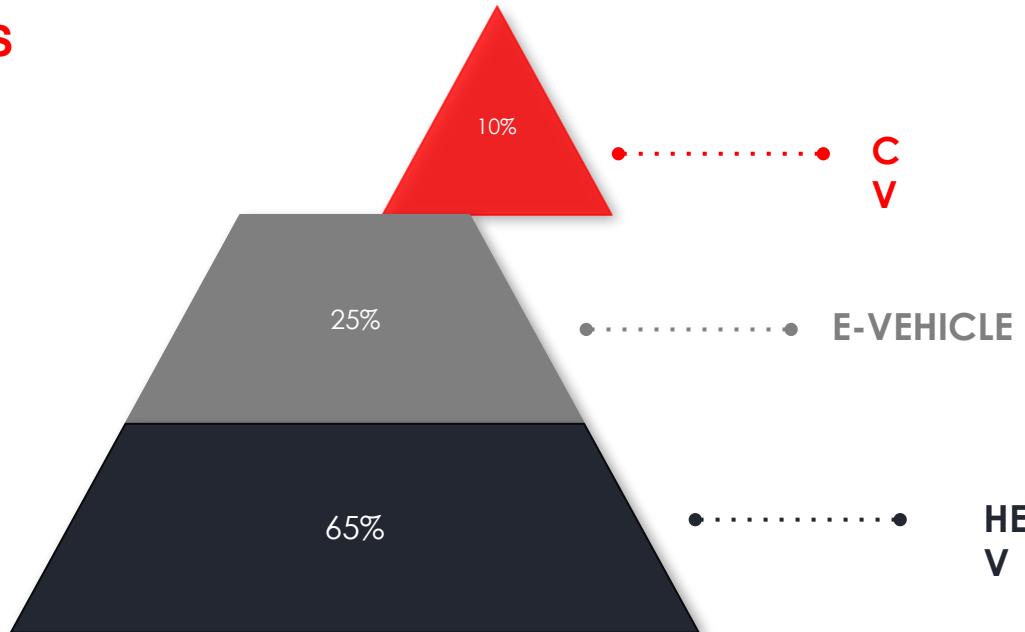
OTHER BENIFITS

ADVANTAGES

- SMOOTH SWITCH BETWEEN EV & CV
- CONSUME LESS FUEL AND EMIT LESS CO₂
- BETTER FOR ENVIRONMENT
- MONEY SAVED
- SAFE TO DRIVE
- LOW MAINTENANCE



PROJECTED VEHICLES NUMBER 2030



Tata's hybrid Product

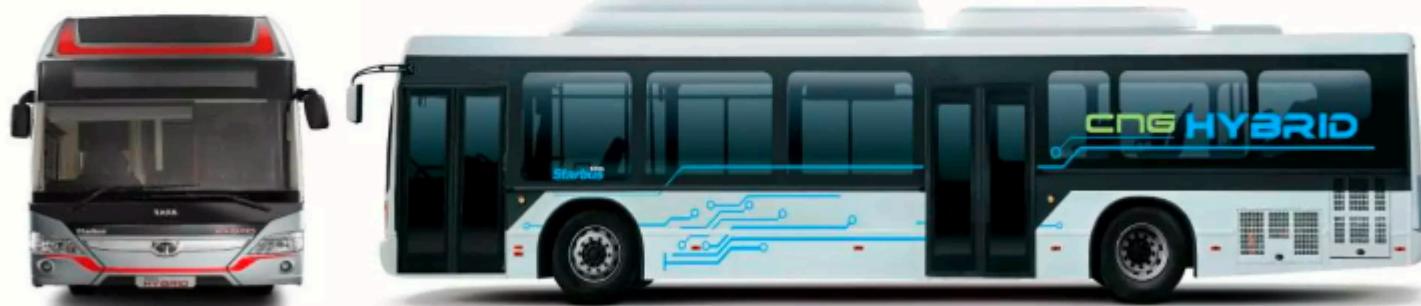


Fig: Tata Starbus hybrid

THANKS

